

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 47453	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/IT2004/000651	International filing date (day/month/year) 25.11.2004	Priority date (day/month/year) 05.12.2003	
International Patent Classification (IPC) or national classification and IPC B65H19/26			
Applicant FABIO PERINI S.P.A.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a.  *(sent to the applicant and to the International Bureau)* a total of 7 sheets, as follows:
    - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b.  *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:	
<input checked="" type="checkbox"/> Box No. I Basis of the opinion <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application	

Date of submission of the demand 30.06.2005	Date of completion of this report 10.11.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Haaken, W  Telephone No. +31 70 340-4278



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IT2004/000651

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-17 as originally filed

**Claims, Numbers**

10-54 received on 30.06.2005 with letter of 29.06.2005  
1-9 filed with telefax on 28.10.2005

**Drawings, Sheets**

1/7-7/7 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- 4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IT2004/000651

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-54
	No: Claims	
Inventive step (IS)	Yes: Claims	1-54
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-54
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**Closest prior art**

US 4 327 877 (D1) is regarded as closest prior art and discloses (the references in parenthesis refer to this document)

a rewinding machine comprising: a winding system (1, 3, 5) and a path for feeding a web material(N) towards said winding system (cf. preamble of **claim 1**), and

a method for the production of logs of wound web material, comprising the following phases:

- feeding the web material (N) to a winding system (1, 3, 5)
- winding a first log ( $R_f$ ) of material
- interrupting the web material at the end of winding said first log, forming a final free edge of said log and an initial free edge for winding of a second log, wherein said material is interrupted by means of timed suction (cf. part of **claim 36**).

The tearing of the web cannot always reliably be effected at the same conditions, see col. 4, line 35: "At this point it is already possible that tearing has occurred..." and col. 4, line 51: "thereby certainly producing the tearing...".

**Problem**

It is regarded as technical problem to have tear and winding start systems that are increasingly efficient and reliable also at high speeds and permit a high level of flexibility, i.e. the possibility of varying the winding parameters in a simple manner. With regard to D1, the objective technical problem can be regarded as increasing the reliability and precision of the tearing process, as well as avoiding the deformation (see col. 4, lines 39-42: "...the free path...is deformed...")

**Solution**

There are a counter surface, along which the web material runs, and at least one suction

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/IT2004/000651

member positioned along said feed path, to temporarily obstruct feeding of the web material and cause interruption thereof at the end of winding each log, said suction member and said counter surface being arranged to generate friction between the web material and said counter surface, said friction causing breakage of said web material by tearing.

**Inventive Step**

The subject matter of claims 1 and 36 is not disclosed by the prior art. Starting from D1, the skilled person does not get any information that would prompt him to arrange a counter surface to the suction member in order to generate a friction between the web material and the counter surface. The subject matter of claims 1 and 36 therefore involves an inventive step.

**Additional remark concerning claims 53 and 54**

When produced with a machine according to claim 1 or any dependent claim or a method according to claim 36 or any dependent method claim, the first turn of the log has no fold and is therefore novel over D1 which clearly indicates that "...the free path C o the paper...is deformed" (D1, col. 4, lines 39-43). The technical features of the independent apparatus or method claim should however be added to the product claims 53 and 54.

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AMENDMENTS UNDER ART. 34 PCTAmended Claims

1. A rewinding machine comprising: a winding system (1, 2, 3) and a path for feeding a web material (N) towards said winding system, characterized in that: a counter surface (33A; 55A), along which said web material runs, and at least one suction member (23) are positioned along said feed path, to temporarily obstruct feeding of the web material and cause interruption thereof at the end of winding of each log (R), said suction member and said counter surface being arranged to generate a friction between the web material and said counter surface (33A; 55A), said friction causing breakage of said web material by tearing.
5. Rewinding machine as claimed in claim 1, characterized in that said winding system is a surface winding system comprising a winding cradle.
10. Rewinding machine as claimed in claim 1 or 2, characterized in that said suction member is in a substantially fixed position.
15. Rewinding machine as claimed in claim 1 or 2, characterized in that said suction member is movable at a substantially different speed from the feed speed of the web material.
20. Rewinding machine as claimed in one or more of the preceding claims, characterized by a winding core (A1, A2) feeder (19, 21), to feed winding cores into an insertion path (17) towards said winding cradle (1, 2, 3).
25. Rewinding machine as claimed in claim 5, characterized in that along said insertion path (17) at least one winding core feed member (13, 13A) is positioned, which moves forward at a speed substantially equal to the speed of the web material.
30. Rewinding machine as claimed in claim 6, characterized in that along said insertion path (17) a rolling surface (15) for said cores is positioned, which forms with said feed member (13) an insertion channel (17) for the winding cores.
8. Rewinding machine as claimed in claim 7, characterized in that said rolling surface and said core feed member are arranged so that the web material is fed between the core and the feed member (13) when the core (A1, A2) is in said insertion path (17).
9. Rewinding machine as claimed in one or more of the preceding claims, characterized in that said winding system is a surface winding system including a first winding roller (1) and a second winding roller (2), defining a nip (5) therebetween, and that said suction member (23) is arranged upstream of said nip with respect to the feed direction of said web material.

10. Rewinding machine as claimed in one or more of the preceding claims, characterized in that along said counter surface at least one suction aperture (37; 59) is provided extending in a direction crosswise to the feed direction of the web material.

11. Rewinding machine as claimed in one or more of claims 6 to 8, 5 characterized in that said at least one feed member feeds the cores along said counter surface (33A; 55A).

12. Rewinding machine as claimed in claims 7 and 11, characterized in that said counter surface (33A; 55A) is opposed to said rolling surface (15), the cores (A1, A2) being inserted between said counter surface and said rolling surface, with the web material 10 (N) positioned between the cores and the counter surface.

13. Rewinding machine as claimed in one or more of the preceding claims, characterized in that said counter surface (33A; 55A) is a fixed surface.

14. Rewinding machine as claimed in one or more of the claims 6, 7, 8, 12, 15 characterized in that said core feed member comprises at least one flexible member (13A) running along said counter surface.

15. Rewinding machine as claimed in one or more of the preceding claims, characterized in that said suction member (23) comprises a sliding valve (39; 65) for rapid opening and closing of suction holes (37; 63) via which said suction member applies suction on said web material, said sliding valve being activated in connection with a 20 switchover phase of the winding cycle performed by said rewinding machine.

16. Rewinding machine as claimed in one or more of the preceding claims, characterized in that it comprises a first winding roller (1) around which at least one flexible member (13A) runs with which the web material fed to said winding cradle is in contact; and in which said suction member (23) is combined with said flexible member 25 presenting a counter surface (33A; 55A), the flexible member (13A) moving along said counter surface.

17. Rewinding machine as claimed in claim 16, characterized in that it comprises a second winding roller (2), defining with said first winding roller (1) a nip (5) for passage of the web material.

18. Rewinding machine as claimed in claims 5 and 17, characterized in that said 30 nip is positioned substantially at the end of said insertion path (17) of the winding cores (A1, A2).

19. Rewinding machine as claimed at least in claim 5, characterized in that said core insertion path is substantially rectilinear.

20. Rewinding machine as claimed in claims 18 and 19, characterized in that said insertion path, said nip and said first and second winding roller are positioned and designed so that the winding core moves in a substantially rectilinear direction along said path and during the winding phase in contact with said first and second winding roller.

5 21. Rewinding machine as claimed in one or more of the preceding claims, characterized in that said at least one suction member is provided with at least one aperture (59) crosswise to the feed direction of the web material.

10 22. Rewinding machine as claimed in claim 21, characterized in that said at least one crosswise aperture (59) communicates with a timed suction chamber (53), which can be connected to a suction source.

23. Rewinding machine as claimed in claim 22, characterized in that said timed suction chamber (53) can be connected by means of an opening and closing member (61-65), controlled in a timed manner, to a continuous suction chamber (51), where a substantially continuous underpressure is maintained.

15 24. Rewinding machine as claimed in claim 23, in which said opening and closing member comprises a sliding plate (65), provided with a plurality of apertures (67), it being possible to position said plate in a position in which said apertures are aligned or alternatively offset with respect to corresponding apertures (63) in a separation wall between said timed suction chamber (53) and said continuous suction chamber (51).

20 25. Rewinding machine as claimed in claim 24, characterized in that said apertures in the plate and said apertures in the separation wall have an elongated configuration in the feed direction of the web material.

26. Rewinding machine as claimed in one or more of the preceding claims, characterized by glue application means for applying glue on said cores.

25 27. Rewinding machine as claimed in one or more of the preceding claims, characterized by blower nozzles (81, 83, 85) to facilitate winding of the free edge around the winding core.

30 28. Rewinding machine as claimed in claim 27, characterized in that it comprises at least one first and one second set of blower nozzles (81, 83) arranged upstream and downstream of the web material suction application area.

29. Rewinding machine as claimed in claim 28, characterized in that said first and said second set of blower nozzles (81, 83) are arranged on the same side of the core insertion path.

30. Rewinding machine as claimed in claim 27, 28 or 29, characterized in that it

comprises a third set of blower nozzles (85).

31. Rewinding machine as claimed in one or more of the claims 27 to 30, characterized in that at least one of said sets of blower nozzles is oscillating or rotating around an axis crosswise with respect to the feed direction of the web material.

5 32. Rewinding machine as claimed in claims 30 and 31, characterized in that said third set of blower nozzles (85) is oscillating.

33. Rewinding machine as claimed in at least claims 30 and 32, characterized in that said third set of blower nozzles (85) is arranged on the opposite side of the core insertion path with respect to said first and said second set of blower nozzles (83, 85).

10 34. Rewinding machine as claimed in one or more of the claims 27 to 33, characterized in that it has no means for applying glue to the winding cores, the winding of each log being started by means of blower nozzles.

15 35. Rewinding machine as claimed in one or more of the preceding claims, characterized in that the core insertion path is designed and arranged so that each core rolls along said path for a distance sufficient to transfer part of the glue previously applied on said core to a portion of web material designed to form the final free edge of the log (R).

36. Method for the production of logs of wound web material, comprising the following phases:

- feeding the web material to a winding system;
- 20 winding a first log (R) of web material;
- interrupting the web material at the end of winding of said first log, forming a final free edge (Lf) of said first log and a initial free edge (Li) for winding of a second log (R);
- characterized in that said web material is interrupted by means of timed suction, which obstructs the feed thereof generating a friction between the web material and a counter surface (33A; 55A), said friction causing breakage of said web material.

25 37. Method as claimed in claim 36, characterized in that said winding system is a surface winding system comprising a winding cradle.

38. Method as claimed in claim 37, characterized in that the web material is fed through a nip formed between a first and a second winding roller, said suction being applied upstream of said nip with respect to the feeding direction of said web material.

30 39. Method as claimed in claim 36, 37 or 38, characterized in that said counter surface is fixed.

40. Method as claimed in one or more of claims 36 to 38, characterized in that said counter surface is movable at a different speed with respect to the feed speed of the

web material.

41. Method as claimed in one or more of claims 36 to 40, characterized in that at least one suction aperture (37; 59) is provided along said counter surface and suction is applied on said web material (N) when it moves along said counter surface.

5 42. Method as claimed in one or more of the claims 36 to 41, characterized in that said logs of web material are wound on winding cores (A1, A2), said cores being fed along an insertion path (17) towards said winding cradle (1, 2, 3).

43. Method as claimed in claim 42, characterized in that said counter surface extends along said insertion path.

10 44. Method as claimed in claim 42 or 43, characterized in that a winding core (A1, A2) is moved along said counter surface, with the web material (N) fed between the counter surface and the winding core, the core advancing in contact with the web material at the same feed speed as the web material.

15 45. Method as claimed in claim 44, characterized in that said timed suction is applied downstream of the position of said core along the insertion path causing interruption of the web material downstream of said core.

46. Method as claimed in claim 43, 44 or 45, characterized in that a core feed member is provided along said counter surface.

20 47. Method as claimed in claim 46, characterized in that said core feed member is moved at a speed substantially corresponding to the feed speed of the web material (N).

48. Method as claimed in claim 46 or 47, characterized in that the web material (N) is passed between said feed member and the core which presses the web material against the feed member.

25 49. Method as claimed in one or more of the claims 42 to 48, characterized in that glue (C) is applied on said winding cores (A1, A2).

50. Method as claimed in claim 49, characterized in that said glue is applied according to at least one longitudinal line.

30 51. Method as claimed in claim 49 or 50, characterized in that at least a part (C1) of said glue (C) is transferred to a portion of web material belonging to the final free edge (Lf) to close the final free edge of said log.

52. Method as claimed in one or more of the claims 42 to 51, characterized in that winding of the initial free edge (Li) around said winding core is started or facilitated by means of one or more jets of air.

53. A log of wound tissue paper, without winding core or mandrel and

- 23 -

comprising a central hole, characterized in that the first turn of said log is without fold.

54. A log of wound tissue paper, with a central winding core to which the initial edge of said paper is anchored by means of glue applied along a longitudinal line, characterized in that the first turn of said log is without fold.